Claims

1. A method for measuring dynamic movement of a joint, the method comprising the steps of:

measuring relative rotation of the joint using pair of Inertia measurement units, each attached to the skin on either side of said joint

capturing a plurality ultrasound images of a bone proximate to a first of said IMU's;

identifying markers on said bone;

tracking displacement of the markers;

correlating said displacement with the relative rotation of the joint, and so;

measuring the dynamic movement of the joint.

2. The method according to claim 1, wherein the identifying step includes matching each marker in consecutive frames.

3. The method according to claim 1 or 2, wherein the tracking step further includes the step of measuring rotation of the markers about a specified axis.

4. The method according to any one of claims 1 to 3, wherein the ultrasound capturing step is provided by an ultrasound sensor attached proximate to the joint.

5. The method according to any one of claims 1 to 4, further including the steps of:

creating an electromyogram in a muscle actuating movement of the joint, and so;

measuring activity data within said muscle;

calibrating the activity data and so calculating a force applied by said muscle to the joint.

6. A system for measuring dynamic movement of a joint, the system comprising:

a pair of Inertia measurement units, each attached to the skin on either side of said joint, said IMU's arranged to measure relative rotation of the joint;

an ultrasound sensor for capturing a plurality images of a bone proximate to a first of said IMU's, and identifying markers on said bone, and;

a control system for receiving the relative rotation from said IMU's and the images captured by said ultrasound;

wherein the control system is arranged to measure displacement of the markers and correlate said displacement with the relative rotation of the joint, and accordingly measure the dynamic movement of the joint.

7. The system according to claim 6, further including an electromyography sensor for measure activity in a muscle actuating movement of the joint, and providing said activity data to the control system, the control system further arranged to calibrate the activity data so as to calculate a force applied by said muscle to the joint.